

## REMARKS

In the Action mailed from the United States Patent and Trademark Office November 17, 2008 claims 3-6 stand objected to because they depend from a cancelled claim; claims 8 and 52 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite; claim 1, 3, 4, 7, 47, 49 and 51 were rejected under 35 U.S.C. § 103 (a) as being unpatentable over USPN 2,403,608 ("Payne") in view of USPN 4,771,805 ("Maa"); claims 1, 3, 5, 7, 9, 10, 47 and 50 were rejected under 35 U.S.C. § 103 as being unpatentable over Payne in view of USPN 4,174,728 ("Usnick"); claims 1, 3-7, 47 and 49 were rejected under 35 U.S.C. § 103 (a) as being unpatentable over Payne in view of USPN 5,927,684 ("Marx"); and claims 1, 7, 8, 47 and 52 were rejected under 35 U.S.C. § 103 (a) as being unpatentable over Payne in view of USPN 2,064,567 ("Riley"). Claims 1, 3, 5-47 and 49-58 are pending. Claims 1, 3-10, 47 and 49-52 are rejected in the pending action. Claims 11-46 and 53-58 are currently withdrawn from consideration. Accordingly, Applicant respectfully provides the following:

### **Claim Objections**

In the Action mailed from the United States Patent and Trademark Office November 17, 2008 claims 3-6 were objected to because they depend from a cancelled claim. Claims 3-6 have been amended to depend from pending claim 1. Accordingly, Applicant requests that the objection to claims 3-6 be removed at this time.

### **Rejections under 35 USC § 112:**

Claims 8 and 52 stand rejected under 35 U.S.C. § 112 second paragraph as being indefinite. Applicant has amended claims 8 and 52 as noted above to denote the structural relationship between the main body and the seat support system. Accordingly, Applicant requests that the §112 rejection of claims 8 and 52 to be withdrawn at this time.

**Rejections under 35 U.S.C. § 103(a):**

Claims 1, 3-10, 47 and 49-52 stand rejected under 35 U.S.C. § 103(a) as being unpatentable. Applicant respectfully submits that the references cited in the Office Action, either alone or in combination with each other, do not teach or suggest all the claim limitations of the claim set provided herein. Likewise, the references fail to clearly and particularly suggest the allegedly obvious combination advanced by the Examiner. M.P.E.P. § 2141 sets forth the Graham factual inquiries that should be considered when making an obvious rejection under Section 103. "The factual inquiries ... are as follows: (A) determining the scope and content of the prior art; (B) ascertaining the differences between the claimed invention and the prior art; and (C) resolving the level of ordinary skill in the pertinent art." (Citing *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966).) While the Graham factual inquiries are familiar, there are additional helpful standards for a Section 103 rejection as set forth below.

As stated by the U.S. Supreme Court in *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. \_\_\_\_, 82 USPQ2d 1385 (2007), "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *Id.* at 1396; See M.P.E.P. 2143. "In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious." M.P.E.P. § 2141.02 (emphasis in original).

Further, M.P.E.P. § 2143 sets forth numerous rationales that may support a conclusion of obviousness. Generally, the legal conclusion of obviousness initially requires "that the prior art include each element claimed, although not necessarily in a single prior art reference, with the only difference between the claimed invention and the prior art being the lack of actual

combination of the elements in a single prior art reference.” *Id.* Further, “[i]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *Id.* (quoting *KSR*, 550 U.S. at \_\_\_, 82 USPQ2d at 1396 (internal quotation marks omitted, emphasis added).) Thus, a rejection under Section 103 cannot stand if it contains a mere statement that the claimed invention would have been obvious without explicitly enumerating the necessary factual findings. Applicant respectfully submits that the references in the Office Action, either alone or in combination, do not teach or suggest all the limitations claimed in the claim set provided herein.

As noted in the specification, the presently claimed valve is utilized in connection with a delayed coking process where molten hydrocarbon resid is fed into a coke drum, thermally cracked into light products and a solid residue referred to as coke. The solid, coal like, petroleum coke is then cut from the interior of the coke drum using high pressure, and allowed to fall through an open valve at the bottom of the coke drum.

The molten resid is heated to thermal cracking temperatures, which range upwards of 1,000° F before being injected into the coke drum. The incoming product is injected into the drum and collides with the opposite side wall resulting in stark heat distribution variances between the vessel, lower spool and de-header valve. As the drum is being filled, a large amount of liquid runs down the sides of the drum into a boiling turbulent pool at the bottom. A de-header valve must be designed to retain tons of molten coke and withstand mechanical stresses induced by the massive heat distribution variances (e.g., thermal ratcheting).

Once the vessel is full, steam is piped through the inlet system into the vessel. High pressure steam is used to strip the coke of valuable hydrocarbon byproducts, which are allowed

to escape through the overhead feed line where they are typically routed to fractionators. Once all of the valuable hydrocarbon by-products have been stripped from the coke resident in the vessel, steam is pumped into the vessel and released through an outlet to the blowdown recovery area until the drum temperature of the vessel and its contents reaches approximately 500° F. Thereafter, water is pumped into the vessel through the inlet system and released into the blowdown area until the contents of the vessel reach approximately 200° F. Accordingly, not only must the de-header valve be designed to endure stress associated with retaining tons of molten coke, but it must also form a tight enough seal to protect internal mechanical features of the valve from being exposed to high-pressure steam, water and fine particulate matter referred to as coke fines.

The valve is then opened. While the valve is moving from a closed to open position it must simultaneously shear the hardened, coal-like, coke from the blind and protect the internal mechanical features of the valve from being exposed to high-pressure steam, water and coke fines.

Once the valve is open, the drum is de-coked. During decoking, high pressure cutting heads are lowered into the drum and used to cut the coke away from the interior of the drum and allowed to fall through the open valve into a collection bin. Some operations allow water to flow through the inlet system during the entire cutting process. In some operations, 400-1000 gallons of water per hour are pumped through the inlet system during the cutting process. Accordingly, the deheader valve utilized during the decoking process, must be designed to retain tons of molten coke, effectively shear hardened, coal like, coke from the blind, all while protecting the internal mechanical features of the valve from being exposed to the molten coke when closed and from water and coke fines while the valve is throttling and maintained in an open position.

**Payne in view of Maa**

Claims 1, 3, 4, 7, 47, 49 and 51 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Payne in view of Maa. Applicant respectfully submits that Payne in view of Maa does not teach every aspect of the claimed invention. Neither Payne nor Maa, independently or in combination, teach “a continuously maintained metal contact seal between said valve closure and said seat support system, said contact seal shearing accumulated coke and effectively de-heading said coke drum upon actuation of said valve closure....” As per the pending Action, Payne is silent as to the valve having the claimed configuration, and Maa is a valve designed to regulate high pressure fluids.

Maa teaches a gate that is loosely received within a suitable rectangular recess designed to regulate high pressure fluids. Column 2, lines 59-61. A gate “loosely received,” as taught by Maa, could not effectively de-head a coke drum repeatedly, and protect the internal mechanical features of the valve neither from being exposed to the molten coke when closed, nor from water and coke fines while the valve is throttling and maintained in an open position. Rather, Maa teaches a valve designed to seal out high pressure fluids without using elastomers. Maa’s pipe bridge valve that is designed to seal the flow of high pressure fluid through a pipe would require substantial modification to act as a de-header unit attached to a coke drum.

In direct contrast, Applicant claims a coke drum de-header system comprising “a continuously maintained metal contact seal between said valve closure and said seat support system, said contact seal shearing accumulated coke and effectively de-heading said coke drum upon actuation of said valve closure....” As Applicant’s valve closure oscillates between an open and closed position, it must scrape accumulated coke from the valve closure as it

moves. As a result, the Maa device does not make obvious the claimed invention. The two devices were created to solve different problems and they do so in very different ways.

Claims 3 and 7 which each depend from claim 1, are patentably distinct from the teachings of the cited references for at least the same reason as stated with respect to claim 1.

Independent claim 47, which includes features generally similar to claim 1, is patentably distinct for at least the same reasons as stated with respect to claim 1.

Claims 49 and 51, which each depend from claim 47, are patentably distinct from the teachings of the cited references for at least the same reason as stated with respect to claim 47.

For at least this reason, Applicant respectfully submits that the prior art references do not, independently or in combination, explicitly or impliedly teach every aspect of the invention as claimed in the independent base claims. In addition, the dependent claims place further limitations on otherwise allowable subject matter. Accordingly, Applicant respectfully submits that the cited art does not teach every aspect of the claims as provided herein and therefore does not render the claims obvious as provided herein.

**Payne in view of Usnick**

Claims 1, 3, 5, 7, 9, 10, 47 and 50 were rejected under 35 U.S.C. 103(a) as being unpatentable over Payne in view of Usnick. Applicant respectfully submits that Payne in view of Usnick does not teach every aspect of the claimed invention. Accordingly, Applicant respectfully traverses this rejection.

As per the pending Action, Payne is silent as to the valve having the claimed configuration. Usnick teaches that “at all times a small clearance obtains between the upper seat and the upper face of the gate.” Column 3, lines 41-43. Further, Usnick teaches that “the gate-to-seat clearance is purged with gas during the periods when 100% contact is not achieved—i.e.,

when the gate is in transit.” Column 4, lines 44-47; See column 2, lines 43-46, column 3, lines 50-51, column 4, lines 14-15 and 23-24, and column 5, lines 24-25. The clearance taught by Usnick allows for “purge gas [to be] admitted...to oppose the buildup of process solids therein.” Column 2, lines 43-46. Because Usnick teaches a small clearance that is maintained at all times between the upper seat and the upper face of the gate, the configuration, as taught by Usnick, cannot shear accumulated coke and effectively de-head the coke drum upon actuation of the valve closure. Further, even a small clearance, as noted in the Action, would quickly cause the valve to fill with quench fluid containing coke fines, rapidly debilitating the internal mechanical components of the valve, requiring costly shutdowns and repair of the valve. Because Usnick teaches a small clearance that is maintained at all times between the upper seat and the upper face of the gate, Usnick does not teach the limitations included in claim 1 such as, the “continuously maintained metal to metal contact seal”.

Claims 3, 5, 7, 9, and 10, which each depend from claim 1, are patentably distinct from the teachings of the cited references for at least the same reason as stated with respect to claim 1.

Independent claim 47, which includes features generally similar to claim 1, is patentably distinct for at least the same reasons as state with respect to claim 1.

Claim 50, which depends from claim 47, is patentably distinct from the teachings of the cited references for at least the same reason as stated with respect to claim 47.

For at least this reason, Applicant respectfully submits that the prior art references do not, independently or in combination, explicitly or impliedly teach every aspect of the invention as claimed in the independent base claims. In addition, the dependent claims place further limitations on otherwise allowable subject matter. Accordingly, Applicant respectfully submits

that the cited art does not teach every aspect of the claims as provided herein and therefore does not render the claims obvious as provided herein.

**Payne in view of Marx**

Claims 1, 3-7, 47 and 49 were rejected under 35 U.S.C. 103(a) as being unpatentable over Payne in view of Marx. Applicant respectfully submits that Payne in view of Marx does not teach every aspect of the claimed invention. Accordingly, Applicant respectfully traverses this rejection.

As per the pending Action Payne is silent as to the valve having the claimed configuration. The Marx valve, like Maa's design, is a pipe bridge valve designed to block the flow of gases containing dust and other adulterated fluid media. Marx does not teach a valve designed for repeatedly deheading a coke drum. In particular, Marx teaches that "[t]he object underlying the present invention is to provide optimum seal conditions in so-called single plate slides...." Column 2, lines 44-47. Accordingly, Marx discloses the use of a resilient pre-stressed seal ring, (Column 2, lines 52-54) and as cited by the pending Action, embodiments with "seal rings consist[ing] of soft resilient material." Column 3, lines 16-25. Even with the use of thin wiper ring of hard metal, Marx's use of resilient soft materials for seal rings would not produce a valve as claimed in claim 1 of the present application, which is used to repeatedly de-head a coke drum and withstand the stresses described above. In direct contrast, as Applicant's valve closure oscillates between an open and closed position, it must scrape accumulated coke from the valve closure as it moves. This "continuously maintained metal to metal contact seal" as claimed in claim 1 is very hard and is not resilient. A resilient seal like that taught in Marx may be effective for blocking the passage of liquid, but would quickly be destroyed if forced to scrape hardened coke from a gate as the entire contents of the coke-filled drum press down on the gate. As a

result, the Marx device does not make obvious the claimed invention. The two devices were created to solve different problems and they do so in very different ways.

Claims 3 and 5-7, which each depend from claim 1, are patentably distinct from the teachings of the cited references for at least the same reason as stated with respect to claim 1.

Independent claim 47, which includes features generally similar to claim 1, is patentably distinct for at least the same reasons as state with respect to claim 1.

Claim 49, which depends from claim 47, is patentably distinct from the teachings of the cited references for at least the same reason as stated with respect to claim 47.

For at least this reason, Applicant respectfully submits that the prior art references do not, independently or in combination, explicitly or impliedly teach every aspect of the invention as claimed in the independent base claims. In addition, the dependent claims place further limitations on otherwise allowable subject matter. Accordingly, Applicant respectfully submits that the cited art does not teach every aspect of the claims as provided herein and therefore does not render the claims obvious as provided herein.

#### **Payne in view of Riley**

Claims 1, 7, 8, 47 and 52 were rejected under 35 U.S.C. 103(a) as being unpatentable over Payne in view of Riley. Applicant respectfully submits that Payne in view of Riley does not teach every aspect of the claimed invention. As per the pending Action, Payne is silent as to the valve having the claimed configuration. Riley teaches away from the present invention by advocating against the use of special seat systems. "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, ... would be led in a direction divergent from the path that was taken by the applicant." In re Gurley, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131 (emphasis added). Riley directly indicates that an object of his invention was to

"provide a gate valve having a one piece casing...and to thus dispense with the need for special seats or two piece casings that are adjustably bolted together or expandible [sic] gates." Column 2, lines 34-40. Additionally, Riley provides that, "[a] further object of the invention is to provide a valve having relatively few and simple parts..." Column 2, lines 46-50. Accordingly, Riley teaches away from the claimed features of the present application. For example, claim one includes limitations for a seat support system structured to support a valve closure, wherein the seat support system comprises at least one live loaded seat. One skilled in the art, motivated by Riley's teaching to "dispense with the need for special seats," would have been led to produce simple seat static seats, a direction divergent from the path that was taken by the Applicant. Because Riley teaches way from the claimed features of the present application, Riley fails to render the claims of the present application obvious.

Claims 7 and 8, which each depend from claim 1, are patentably distinct from the teachings of the cited references for at least the same reason as stated with respect to claim 1.

Independent claim 47, which includes features generally similar to claim 1, is patentably distinct for at least the same reasons as state with respect to claim 1.

Claim 52, which depends from claim 47, is patentably distinct from the teachings of the cited references for at least the same reason as stated with respect to claim 47.

For at least this reason, Applicant respectfully submits that the prior art references do not, independently or in combination, explicitly or impliedly teach every aspect of the invention as claimed in the independent base claims. In addition, the dependent claims place further limitations on otherwise allowable subject matter. Accordingly, Applicant respectfully submits that the cited art does not teach every aspect of the claims as provided herein and therefore does not render the claims obvious as provided herein.

### CONCLUSION

Applicant submits that the amendments made herein do not add new matter and that the claims are now in condition for allowance. Accordingly, Applicant requests favorable reconsideration. If the Examiner has any questions or concerns regarding this communication, the Examiner is invited to call the undersigned.

DATED this 17 day of February, 2009.

Respectfully submitted,



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